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EXAMINER	
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/562,558	KIM, BONG-TAEK	
	Examiner	Art Unit	
	JONATHAN M. DAGER	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04 November 2009 has been entered.

Response to Arguments

1. Applicant's arguments, see page 8 filed 05 October 2009 with respect to the objection to claim 5 have been fully considered and are persuasive due to amendment. Therefore, the objection to claim 5 has been withdrawn.

2. Applicant's arguments, see pages 8-9 filed 05 October 2009 with respect to the rejection of claim 1 under 35 U.S.C. 112, 1st paragraph have been fully considered and are persuasive due to amendment. Therefore, the rejection of claim 1 under 35 U.S.C. 112, 1st paragraph has been withdrawn.

Subsequently, the prior rejection of all claims dependent therefrom under identical grounds is withdrawn.

3. Applicant's arguments, see pages 8-9 filed 05 October 2009 with respect to the rejection of claim 1 under 35 U.S.C. 112, 2nd paragraph have been fully considered and are persuasive

due to amendment. Therefore, the rejection of claim 1 under 35 U.S.C. 112, 2nd paragraph has been withdrawn.

Subsequently, the prior rejection of all claims dependent therefrom under identical grounds is withdrawn.

4. Applicant's arguments, see pages 9-10 filed 05 October 2009 with respect to the rejection of claim 2 under 35 U.S.C. 112, 2nd paragraph (antecedent basis) have been fully considered and are persuasive. Therefore, the rejection of claim 2 under 35 U.S.C. 112, 2nd paragraph (antecedent basis) has been withdrawn.

5. Applicant's arguments, see pages 10-12, filed 05 October 2009, have been fully considered but they are not persuasive.

The Applicant has contended that claim 1, as amended, has not been rendered obvious under 35 U.S.C. 103(a) in view of the combination of Kane (US 2004/0006413) and Hash (US 6,349,116), and that the prior rejection of the claims should therefore be withdrawn.

The Examiner respectfully disagrees; regarding claim 1, Kane discloses that some train control systems, such as Track Warrant Control System sold by RDC (Railroad Development Corporation), have automated some of the track warrant control method, such as by sending the warrant to the train via a computer system. Another system, Automatic Block Signaling (ABS), provides for automated wayside signaling of block status and authority to enter or occupy a block. In this system, track warrants may overlap and the conductor or engineer uses the

automatic wayside signals to determine when and how to proceed in a given block. Again, human beings are involved and errors are possible (para 0006).

Thus, Kane discloses that it is known for railway systems to incorporate ground (wayside) equipment.

Kane also discloses that it is known to automate the braking of a train due to block occupancy. For example, a rudimentary system known as Automatic Train Stop (ATS), sold by Union Switch and Signal Inc., functions by means of a mechanical contact between a wayside trip arm and a brake emergency trip switch or cock mounted to the car. If the wayside signal is in a stop condition and the train passes the signal, the wayside trip arm activates the emergency brake switch, thereby initiating an emergency brake operation. One problem with a rudimentary system such as this is that the braking operation is not started until the train passes the wayside switch, which means the train will not stop until some point after the switch. Thus, the system will not prevent a collision with an object that is close to the wayside signal (para 0009).

Kane discloses that in an Automatic Train Control (ATC) system, train location information, speed information, and train control information are continually exchanged between a train cab and computerized wayside controllers in real time (in some systems, track rails are used to carry this information). In this system, it is not necessary for a conductor or engineer to look for wayside signals. If a wayside signal is missed by a conductor or engineer, or conditions change after the wayside signal is passed, the information is available to the conductor or engineer in the cab. Some ATC systems automatically apply the brakes if a stop signal is passed. As discussed above in connection with the ABS system, such after-the-fact braking systems may not prevent collision with an object located in close proximity to a wayside signal. Other

systems, such as the Advanced Train Control System proposed by Rockwell International, will automatically apply the brakes if a track warrant is about to be exceeded (para 0011).

ATC system has been combined with a Positive Train Stop (PTS) system. The PTS system uses transponders along the tracks and on-board receivers to supplement the ATC system. PTS is an intelligent system that anticipates signaling and will stop or slow the train automatically without operator input. For example, as discussed above, while ATC will stop the train automatically if the train runs through a stop signal, PTS will stop the train before actually going through a stop signal. In addition, the PTS system allows for "civil-speed" and "temporary construction" speed restrictions. The term Advanced Speed Enforcement System (ASES) is used when ATC and PTS are combined (para 0013).

Thus, it is known that the wayside equipment can transfer the ground information using an ATS member connected to a track occupancy detector through narrow space data communication (transponder/transceiver system), and a program part for inputting ground data to the wayside equipment. It is noted that the ATC system utilizes transponders sending beacon signals (also see para 0044), which suggests the use of K-Balises.

Further, the above citations clearly disclose the ATS and ATP functionality of the onboard equipment, as well as an onboard transponder system.

Kane discloses that a second traditional system known as Centralized Traffic Control (CTC) allows a dispatcher to control movement of trains by controlling track switches and wayside signals from a central dispatch office. In these systems, there is no direct communication with the locomotive cab; rather, the dispatcher sends commands to switches and wayside signals and receives feedback from them. Again, the wayside signal indicates authority

to occupy a block or to proceed to the next block. These systems still require a human operation to control movement of the train in accordance with wayside signals. Updated CTC systems such as the Radio Actuated Code System from Harmon Electronics integrate differential GPS (global positioning system) technology and other technology into these systems (para 0008).

Thus, it is disclosed a program part for inputting the ground information data to the wayside equipment.

Kane discloses that the current onboard equipment includes an axle drive speed indicator 105 which is also connected to the control module 110. The axle drive speed indicator 105 is a tachometer which measures the axle rotation, from which the speed of the train can be derived if the wheel size is known. End-of-axle magnetic pick-ups are used in some embodiments. It is also possible to use a signal that measures the rotation speed of the motor driving the axle to perform this function. In the event that the GPS system becomes unavailable, the system can operate by estimating distance traveled from the rotation of the axle or motor (para 0032).

Thus, Kane discloses utilizing a rotary type speed detector connected to the shaft of the wheel, as well is displaying the train speed.

Kane discloses that a display 180 connected to the control module 110 is used to present various information to the conductor or engineer. An exemplary display 200 is illustrated in FIG. 2. The display 200 shows the current train speed in field 210 and the maximum allowable speed (if a maximum is in effect) in field 212. The display 180 also shows the train's exact position in field 214 and the limits of the train's authority at filed 216. Also included in the display 180 is a first graph 218 indicating the grade of the tracks in the immediate area of the train and a second graph 220 indicating the direction of the track relative to the locomotive cab. The display 180

also lists, in fields 222 and 224, current and upcoming speed restrictions over limited areas of the track (in the example of FIG. 2, the speed restrictions are "Form A" speed restrictions, which will be discussed in further detail below) (para 0043).

The train system 100 is capable of two modes of operation. In the semiautomatic mode, movement of the train is under the control of the conductor or engineer provided that the conductor or engineer operates the train in an acceptable manner. In the automatic mode, the system 100 controls the movements of the train. In this mode, the conductor or engineer intervenes only when necessary to deal with unforeseen situations, such as the presence of an unauthorized person or thing on the tracks (para 0047).

Thus, the onboard equipment of Kane is fully capable of displaying speed information, ground information, an operation switch for selecting an operating mode, and a train brake controller (also see brake interface, figure 1 item 150).

Lastly, Kane discloses that connected to the control module is a communications module 120. The communications module is responsible for conducting all communications between the system 100 and the central dispatcher computer system (not shown in FIG. 1). These communications may occur in a variety of ways, such as over the air or through the rails of the train track. In some embodiments, wayside signals transmit information to the system 100. All equipment necessary for such communications (e.g., antennas) are connected to the communications module 120 (para 0029).

Thus, Kane discloses that the onboard equipment does include means for transmitting onboard information and ground information to a central control system and receiving radio commands from the central control system.

While Kane does disclose transponder technology, the coil and oscillator are not explicitly disclosed. However, it is implicit that the onboard coil and oscillator as disclosed would be contained in the on-board equipment with the antenna; otherwise, the wireless communication between the wayside equipment, central station, and on-board equipment could not occur.

While Kane does disclose most embodiments, it is still not explicitly anticipated wherein a frequency for transmitting information from the wayside equipment is selected by the ground equipment.

Hash teaches an invention in which a non-propagating magnetic field-based communication system transmits and receives digital data within a limited coverage area environment. The system includes a compact transmitter unit, such as that contained in a `tracking` tag affixed to an object, and a digital detector/demodulator unit. In order to generate and FSK-modulate a non-propagating magnetic field in accordance with modulation signals representative of the digital data, the transmitter unit contains a magnetic field coil and one or more capacitors controllably switched in circuit with the coil in accordance with the data, so as to change the resonant frequency of an inductor-capacitor transmitter resonant circuit. The receiver unit includes a magnetic field-sensing coil in circuit with a capacitor, to form a receiver resonant circuit that resonates at a frequency between the FSK frequencies modulated by the transmitter unit. A digital receiver/demodulator detects whether received frequencies are valid FSK frequencies and derives digital data using differences between valid detected FSK frequencies (abstract).

The device of Kane has outlined embodiments of the claimed invention. That is, a train communication network consisting of wayside equipment, onboard equipment, an on-board transceiver complete with antenna, coil, and oscillator; a display, a train controller, a communication module. Where Kane is deficient, with respect to claim 1 is that Kane does not explicitly disclose varying the transmission frequency between the equipment. Hash teaches an invention capable of the embodiments.

All of the components and methods are known in the above prior art. The only difference is a combination of these elements into a single device.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the communication system of Hash onto the base device of Kane, since both systems could be used in combination to produce the predictable result of a selecting a communication frequency as a function of data to be transferred in a given time.

Combining prior art elements according to known methods to yield predictable results is a rationale to support a conclusion of obviousness. See MPEP 2143(a).

5a. It is noted that the Applicant has contended (see arguments filed 05 October 2009, pages 10-11) that Kane does not teach or disclose the use of a K-Balise device.

The Examiner respectfully disagrees; Kane discloses that the control module 110 is the center of the train control system and is responsible for controlling the other components of the system. Connected to the control module is a communications module 120. The communications module is responsible for conducting all communications between the system 100 and the central

dispatcher computer system (not shown in FIG. 1). These communications may occur in a variety of ways, such as over the air or through the rails of the train track. In some embodiments, wayside signals transmit information to the system 100. All equipment necessary for such communications (e.g., antennas) are connected to the communications module 120 (para 0029).

Thus, from the above citation, the wayside equipment is configured for wireless communication with the train controller. Further, from the above, the transmitted information may comprise data from the central dispatch controller.

Kane discloses a computerized train control system in which a dispatcher sends track warrants directly to a locomotive cab, and which will not allow the train to move at all, whether the train is on the main line or in a train yard, until an appropriate authority is received and that will automatically stop in the event of a computer failure or the train before the train can exceed a track warrant limit (para 0019).

Thus, the wayside devices of Kane are configured for receiving information from the central dispatcher, and relay the information to the train controller. From the above, such information includes track warrants (i.e. "ground conditions", etc.).

As cited in the current specification at paragraph 0002, "...a device transmitting ground information for an automatic train stop is called Balise. The Balise is a device for transmitting, using data communication, ground information such as ground operation conditions, distance and position of the beacon, and a target speed from a ground equipment to an on-board equipment."

Thus, from the above paragraphs, the wayside device of Kane can clearly be called a Balise in that they are devices for transmitting ground information for an automatic train stop.

The wayside devices of Kane are configured for transmitting via data communication ground information such as ground operating conditions, target speed (also see para 0048-0051 of Kane with respect to track warrants and authorities impacting train target speed).

As cited in the current specification (see paragraph 0003), a K-Balise (or Euro-Balise) is defined as "...a Balise integrating a beacon, a tag (Transponder or Loop Coil), card or terminal. Particularly, it includes a Euro Balise and is called as K-Balise in the present invention."

As cited above, it is known that wayside equipment can be a transponder along the tracks to relay information (see Kane at 0013) to relay track information. Aside from that which is known, Kane discloses that the display also includes a number of acknowledgment buttons 230 as recited in U.S. Pat. No. 6,112,142. As the train approaches a wayside signal, the state of the signal is transmitted via radio to the system. When the operator sees the wayside signal, the operator must acknowledge the wayside signal by pressing a corresponding acknowledgment button (para 0044).

Thus, from the above citation(s), the wayside equipment is configured for issuing a beacon signal via wayside terminal. As such, the wayside equipment as described by Kane is equivalent to the K-Balise which is outlined in the current specification.

Therefore, the Examiner maintains the previous rejection of independent claim 1 as obvious under 35 U.S.C. 103(a) for those reasons above, and for those found in the prior office action, which is incorporated herein.

5b. It is noted that the Applicant has contended (see arguments filed 05 October 2009, page 11, third paragraph) that Kane does not teach or disclose a program part for inputting information into the K-Balise.

The Examiner respectfully disagrees; as previously cited, there is known a second traditional system known as Centralized Traffic Control (CTC) allows a dispatcher to control movement of trains by controlling track switches and wayside signals from a central dispatch office. In these systems, there is no direct communication with the locomotive cab; rather, the dispatcher sends commands to switches and wayside signals and receives feedback from them. Again, the wayside signal indicate authority to occupy a block or to proceed to the next block. These systems still require a human operation to control movement of the train in accordance with wayside signals. Updated CTC systems such as the Radio Actuated Code System from Harmon Electronics integrate differential GPS (global positioning system) technology and other technology into these systems, but they are still subject to human error (para 0008).

While it may not be explicit from the above paragraph, Kane is still inherently disclosing the contended embodiment, since it is known that the wayside equipment would be configured with a program part to accept the incoming ground information from the dispatch and to relay the information to the train via K-Balise. Otherwise, the wayside equipment would not be able to pass on the information from the central dispatch to the train controller.

As to limitations which are considered to be inherent in a reference, see MPEP 2112.01.

Therefore, the Examiner maintains the previous rejection of independent claim 1 as obvious under 35 U.S.C. 103(a) for those reasons above, and for those found in the prior office action, which is incorporated herein.

5c. It is noted that the Applicant has contended (see arguments filed 05 October 2009, pages 11-12) that Kane, as modified above by Hash, does not teach or disclose the amended embodiments of independent claim 1.

The Examiner respectfully disagrees; in addition to that which is cited above, it was noted in the prior office action (see item 15 covering pages 15-16) the claims contain multiple statements of intended use or field of use (e.g. "for implementing", "for transferring", "for converting", "wherein…is selected", etc.). These statements of intended use or field of use, or "wherein" clauses are essentially method limitations. Thus, these claims, as well as other statements of intended use, do not serve to patentably distinguish the claimed structure over that of the reference.

See MPEP § 2114 which states:

> A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim.
>
> Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions.
>
> Apparatus claims cover what a device is not what a device does.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

Additionally, the terms "configured to" or "arranged to" are considered to be structurally modified statements and are not intended use. Claims amended to include the above listed language may patentably distinguish themselves structurally.

Therefore, the Examiner maintains the previous rejection of independent claim 1 as obvious under 35 U.S.C. 103(a) for those reasons above, and for those found in the prior office action, which is incorporated herein.

6. Applicant's arguments, see page 13 paragraphs 1-2 filed 05 October 2009, with respect to the rejection of claim 5 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive.

The Applicant has contended that since claims 5 depends from the now allowable independent claim 1, the claim 5 is allowable.

The Examiner respectfully disagrees; independent claim 1 remains rejected, hence, claim 5 remains rejected under 35 U.S.C. 103(a) as obvious over the combination of Kane and Hash, and further in view of Lacote (US 2004/0006413) for those reasons cited above as well as the previous grounds discussed in the prior office action, which are incorporated herein.

7. Applicant's arguments, see page 13 paragraphs 3-4 filed 05 October 2009, with respect to the rejection of claim 11 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive.

The Applicant has contended that since claims 5 depends from the now allowable independent claim 1, the claim 11 is allowable.

The Examiner respectfully disagrees; independent claim 1 remains rejected, hence, claim 11 remains rejected under 35 U.S.C. 103(a) as obvious over the combination of Kane and Hash,

and further in view of Ralph (US 6,823,242) for those reasons cited above as well as the previous grounds discussed in the prior office action, which are incorporated herein.

8. Although not specifically argued, claims 2-4, 6-10, and 12-14 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Kane (US 2004/0006413), and further in view of Hash (US 6,349,116) for those reasons cited above, and those found in the prior office action, which is incorporated herein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN M. DAGER whose telephone number is (571)270-1332. The examiner can normally be reached on 0830-1800 (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JD
11 January 2010

/Jack W. Keith/

Supervisory Patent Examiner, Art Unit 3663